

## Professor Yokichi Takayanagi

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*Yokichi Takayanagi*

## Professor Yokichi Takayanagi

### His Career and Scientific Achievements

It has fallen out that few men would render service to the science of paleontology in so fervent ways as Professor Yokichi Takayanagi has done. His predecessor used to enjoy playing "go" every once in a while, but he has always been among staunch scientists and never seemed to feel any pleasure in wasting time over such nonproductive ways. It may be appropriate, therefore, that we present our homage to him on the occasion of his retirement, in March of 1990, from a long and devoted tenure of teaching and research at Tohoku University, Sendai. It also seems fitting that the year of his retirement is marked by two significant events in his field: the centennial of Japanese micropaleontology, which began when Dr. Matajiro Yokoyama first described foraminifera, and the Fourth International Symposium on Benthic Foraminifera (Benthos '90) to be held in Sendai City where Prof. Takayanagi has spent most of his life.

He was born in Tokyo, the metropolitan of Japan, on October 7, 1926, as the first-born son of Shinzo Takayanagi, Law Professor of Tohoku University, and Keiko Takayanagi. However, he grew up and received his schooling in Sendai, the most populous city in northeastern Japan.

After finishing his early education, he majored in geology and paleontology at the Institute of Geology and Paleontology, Faculty of Science, Tohoku University, and came under the influence of Dr. Kiyoshi Asano. After his graduation in March of 1950, he was appointed Research Associate at the same institution, where he began working in earnest on micropaleontology. His long and distinguished career, however, had already begun while he was still an undergraduate. In the year of his graduation, he published his first paper on Pliocene smaller foraminifera from western Sendai, shortly followed by more than ten papers on Neogene and Holocene benthic smaller foraminifera, published in the early 1950's, and several papers on Cretaceous to Paleogene foraminifera, published in the late 1950's. Among them are challenging studies on the distributional ecology of Holocene benthic smaller foraminifera which are suggestive of unique features of his later scientific activities. In the meantime, he developed, in particular, a deeper interest in the monographic work on Cretaceous benthic foraminifera of Japan, and was able to produce his major scientific achievement in the 1960's.

Professor Yokichi Takayanagi's scientific career is, on the whole, characterized by pioneering the way for researching smaller foraminifera in Japan. A significant synthesis of his research on foraminifera was made in 1960, under the title "Cretaceous foraminifera from Hokkaido, Japan" (*Science Reports of the Tohoku University, Sendai, Second Series (Geology)*, vol. 32, no. 1), for which he was

awarded the Degree of Doctor of Science. In 1965, he was also awarded the scholarship Prize of the Palaeontological Society of Japan for outstanding contributions to the study of Cretaceous foraminifera.

After receiving his doctorate, he made efforts to modernize the study of Japanese micropaleontology, although his concentration at that time was largely in the monographic work of Japanese benthic smaller foraminifera. There are many trial studies that Professor Takayanagi run in association with his students and other collaborators: First of all, in the 1960's, he expanded his research to include the study of planktonic foraminifera. During this period, he published several papers on biostratigraphy by means of planktonic foraminifera and expanded the range of his interest over their origin/development, paleoecology/application, wall microstructure, paleogeography, and so forth, and geographically, to California (Putah Creek subsurface section) and the Philippines.

In the 1970's, he was productive more than ever: he produced more than 70 publications, including six textbooks, and served as the editor of several books, which signifies the considerable change in his interests. During this period, he concentrated his attention especially on the integrated microbiostratigraphy of the Neogene rather than the Cretaceous, employing datum planes defined among various groups of planktonic fossils in association with magnetostratigraphy and radiometric data, with the aim of establishing world-wide correlations and its application to a wide range of scientific subjects, including geohistory, stage problems, and the origin of the Sea of Japan. In addition to these new pursuits, he continued in the latter part of this period to publish several papers regarding Cretaceous microbiostratigraphy. The prospect of his future research may be further revealed by more than 20 review articles which he wrote, covering topics in paleoclimatology, paleoenvironments, and paleoceanography.

The 1980's, the culminating decade of his career, saw research on "the Ocean Characteristics and their Changes", a multi-disciplinary project supported by the Special Project Research, Ministry of Education, Science and Culture of the Government of Japan. Prof. Takayanagi took charge of one division, "the Paleoenvironments on the Ocean Bottom During the Quaternary", in cooperation with many scientists in various fields, including his colleagues and students. During the course of this study, he was able to fulfill his dearest wish that he has kept all to himself since the last decade. He first examined planktonic foraminifera from the surface of sea bottom sediments from 180 stations in the marginal area of the Northwest Pacific, relating them with such environmental parameters as water temperature, salinity, and water depth, with an eye to the formulation of transfer functions unique to the Northwest Pacific, where lie the Japanese Islands he has lived in. In the later part of this work, Prof. Takayanagi managed to put his hands on material from an exploratory well for oil and gas, called Sk-1, drilled in the shallow-waters off the coast of Kashima, toward the central part of the Main Island and examined the entire well depth for

sedimentology and micropaleontology, invoking the transfer functions to numerically elucidate the vicissitudes of paleoenvironments for the last several hundreds of thousands of years. Even in his other research of land sections, he often took care to have his assistants with him to construct the framework of high resolution integrated biostratigraphy by combining datum planes defined among various groups of microfossils and assessing its significance for paleoceanography. He was also involved in research on the Shimanto terrain on Shikoku Island, having success in making great contributions to the biostratigraphy of the Cretaceous.

Beyond all this, toward the end of this decade, Prof. Takayanagi accomplished his greatest achievements in foraminiferalogy: one is "the Checklist and Bibliography of Post-Paleozoic Foraminifera Established by Japanese Workers, 1890-1986", which is still to be updated by him; the other is "the Foraminifera from the Japanese Islands", which is the result of research supported by the Cooperative Research, Ministry of Education, Science and Culture of the Government of Japan. These great compendia obviously represent the achievements of a century of study of foraminifera in Japan, and have raised the study of foraminiferal paleontology to a new level, thus encouraging further advances in the field.

His long and outstanding teaching career began immediately after graduation in geology and paleontology at Tohoku University. He joined the faculty at Tohoku University, receiving a full professorship in 1974, a position he has held up to the present. Over the years he has been called upon to give lectures at 15 major universities, including Hokkaido University, the University of Tokyo, the University of Tsukuba, Kyoto University, and Nagoya University, as well as at numerous professional societies or institutions in Japan. During 40 years of teaching, Prof. Takayanagi has inspired and promoted the careers of a large number of students, many of whom have already achieved distinction in the academic world and industry at home and abroad. Not a few overseas scholars came to Sendai to study micropaleontology at Tohoku University under his guidance. Teaching would have constituted a busy and troublesome chore for most of us, but Prof. Takayanagi's abundant talents enabled him to excel at teaching while remaining an extraordinarily active researcher.

His amazing administrative caliber is impressive as well. He served as chairman of his institute for the greater part of the period from 1974 to 1987. At the same time he has filled many other important administrative positions at his university: he worked on the council of the University Library from 1977 to 1986, and has served as President of the Kita-aobayama Branch of the University Library since 1986. He has also been active in many professional societies. He has been a councilor of the Palaeontological Society of Japan since 1971, the Editor-in-Chief of its journal "Fossils" for many years, and served as President of the Society from 1977 to 1978. In the meantime, he has also been a councilor of the Tokyo Geographical Society since 1987, and was of the Geological Society of

Japan from 1975 to 1976. He has been or was either a member or a liaison of some 25 national and international committees or commissions, including the Scientific Committee on Oceanic Research (International Council of Scientific Unions), the International Union of Geological Sciences, the International Union for Quaternary Research, the Liaison Committee for Paleontology, and the Liaison Committee for Physical Oceanography (Science Council of Japan), IPOD, KAIKO, and ODP. In addition to his these numerous activities, he has served as either an editor or a foreign correspondent for the *Journal of Foraminiferal Research*, the *Micropaleontology*, the *Revista Española de Micropaleontología*, and the *Marine Micropaleontology*.

His first research trip abroad was to Stanford University, where he spent one year for foraminiferal research in 1961. He subsequently visited the Philippines and Taiwan for geological and paleontological reconnaissance in 1964. Since then he has been abroad once or twice every year to participate in international symposia, congresses, and workshops, including the International Geological Congress, the Pacific Science Congress, SCOR, IPOD, and ODP, and so he has consistently presented his up-to-date work to an international public.

It is a great pleasure for me to have known Prof. Takayanagi for most of his career, and to be given the opportunity to write this biographical account in his honor. The foregoing remarks are, in fact, too formula, and failed to capture his personal qualities. For in reality, among flesh and blood gentlemen is Prof. Takayanagi. In his younger days, I have heard, he would occasionally climb up telephone poles upon drinking sake (Japanese wine) at a feast, where he would sing to the entire company, with great melancholy and a jesting Tohoku dialect, the Song of Arabia, a popular Japanese song from the good old days. Yet he is also a fine painter, illustrator, author, and linguist. He possesses the rare ability to depict detailed and fascinating illustrations of foraminifera, but his fingers may have been itching since the SEM came into wide use. This year he will once again exercise his talents: he will depict his favorite creatures on the covers of various prints that will appear in public at the Benthos '90, for which he is also serving as Chairman. He has also been devoted to linguistic pursuits for the last several years. He is often engrossed in using a literal rather than a figurative phrase, and lingers carefully over his choice of words.

Professor Yokichi Takayanagi has produced an amazing volume of excellent research that is summarized in the more than 200 publications listed below. These range over wide fields of earth science, but foraminifera have been his special interest; his moving studies of these creatures have earned him widespread recognition as a first-rate investigator. This is represented by the following existent foraminifer taxa named after him: the genus *Takayanagia* and such species as *Eggerella takayanagii*, *Epistominella takayanagii*, *Guttulina takayanagii*, *Nonion takayanagii*, *Pararotalia? takayanagii*, *Psamminopelta takayanagii*, and *Chilostomelloides yokichii*. Along with this, as a teacher, he has maintained standards of

excellence that have strongly inspired and promoted the careers of numerous students, disciples, and associates. As an administrator, he has launched, reformed, and influenced many organizations and journals. In addition, as the author of two monumental books on foraminiferal studies, he has established a new standard of scientific knowledge and inquiry for future generations of foraminiferal researchers. Above all these accomplishments, Prof. Takayanagi is sincere, generous, and dedicated in purpose.

It is a matter worthy of congratulation that even after his retirement from a busy and productive career, the devotion of the venerable Professor will linger on to serving as Chairman of Benthos '90, the Fourth International Symposium on Benthic Foraminifera, to be held in Sendai in the year of his retirement. This seems a fitting accomplishment to adorn the final page of his distinguished career.

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